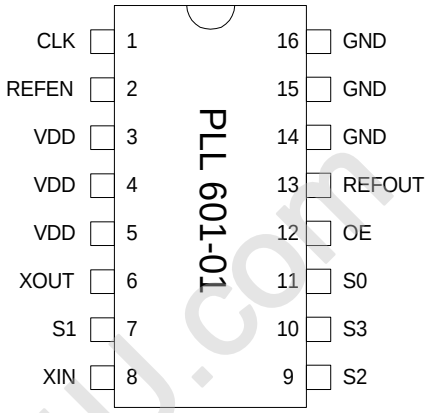
Low Phase Noise PLL Clock Multiplier

FEATURES

- Full swing CMOS outputs with 25 mA drive capability at TTL levels.
- Reference 10-27MHz fundamental crystal or clock.
- Integrated crystal load capacitor: no external load capacitor required.
- Output clocks up to 160MHz at 3.3V.
- Low phase noise.
- Output Enable function tri-state outputs.
- Low jitter: Less than 60 ps cycle to cycle.
- Advanced, low power, sub-micron CMOS process.
- 3.3V operation.
- Available in 16-Pin SOIC or TSSOP.

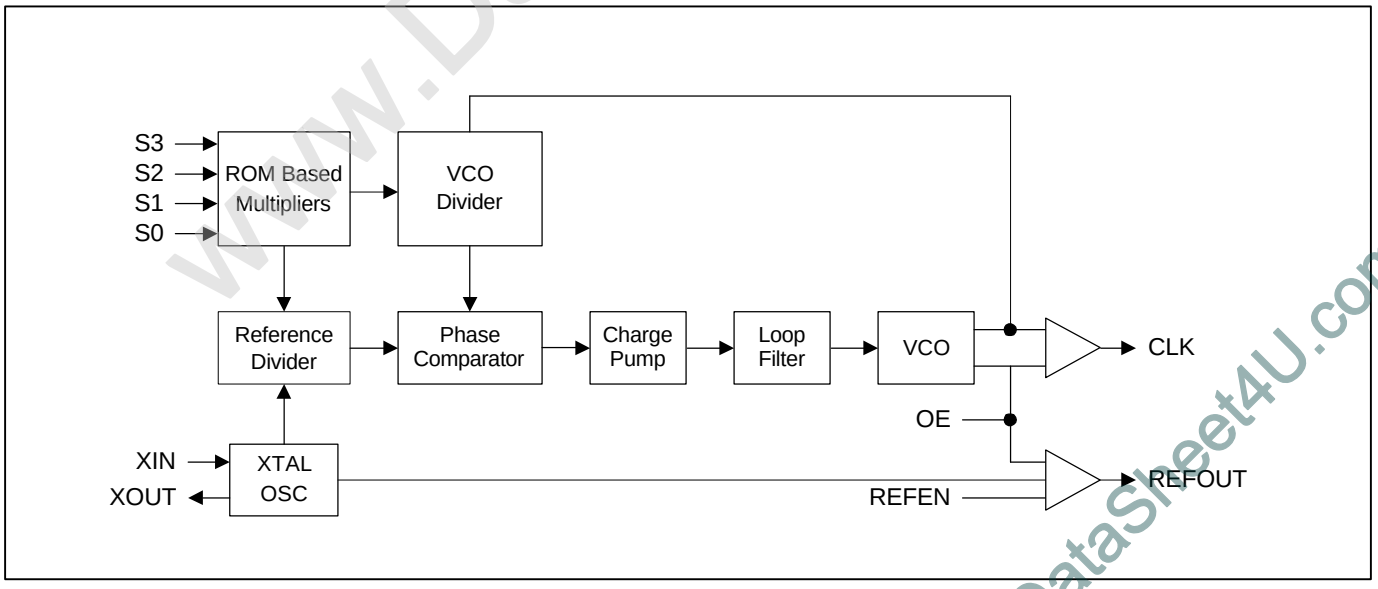
PIN CONFIGURATION



DESCRIPTIONS

The PLL601-01 is a low cost, high performance and low phase noise clock synthesizer. With PhaseLink s proprietary analog and digital Phase Locked Loop techniques, the chip accepts 10-27MHz crystal or clock input, and produces outputs clocks up to 160MHz at 3.3V.

BLOCK DIAGRAM



PIN DESCRIPTIONS

Name	Number	Type	Description
CLK	1	O	Clock output from VCO. Equals the input frequency times multiplier.
REFEN	2	I	Reference clock enable. When Low, it turns off REFOUT.
VDD	3,4,5	P	3.3V Power Supply.
XIN	8	I	Crystal input to be connected to 10-27MHz fundamental parallel mode crystal (C_L=18pF). On chip load capacitors: No external capacitor required.
XOUT	6	O	Crystal Connection.
OE	12	I	Output Enable. Tri-state CLK and REFOUT when low. Has internal pull-up.
REFOUT	13	O	Buffered crystal oscillator clock output. Controlled by REFEN.
S0	11	I	Multiplier Select Pin 0. Determines CLK output. Has internal pull-up.
S1	7	I	Multiplier Select Pin 1. Determines CLK output. Has internal pull-up.
S2	9	I	Multiplier Select Pin 2. Determines CLK output. Has internal pull-up.
S3	10	I	Multiplier Select Pin 3. Determines CLK output. Has internal pull-up.
GND	14,15,16	P	Ground.

MULTIPLIER SELECT TABLE

S3	S2	S1	S0	CLK
0	0	0	0	Test
0	0	0	1	Input x 11
0	0	1	0	Input x 1
0	0	1	1	Input x 3
0	1	0	0	Input x 4
0	1	0	1	Input x 5
0	1	1	0	Input x 6
0	1	1	1	Input x 8
1	0	0	0	Input x 7
1	0	0	1	Crystal Oscillator Frequency Pass through
1	0	1	0	Input x 2
1	0	1	1	Input x 9
1	1	0	0	Input x 8
1	1	0	1	Input x 10
1	1	1	0	Input x 12
1	1	1	1	Input x 16

ELECTRICAL SPECIFICATIONS

1. Absolute Maximum Ratings

PARAMETERS	SYMBOL	MIN.	MAX.	UNITS
Supply Voltage Range	V_{CC}	-0.5	7	V
Input Voltage Range	V_I	-0.5	V_{CC}+0.5	V
Output Voltage Range	V_O	-0.5	V_{CC}+0.5	V
Soldering Temperature			260	°C
Storage Temperature	T_S	-65	150	°C
Ambient Operating Temperature		0	70	°C

Exposure of the device under conditions beyond the limits specified by Maximum Ratings for extended periods may cause permanent damage to the device and affect product reliability. These conditions represent a stress rating only, and functional operations of the device at these or any other conditions above the operational limits noted in this specification is not implied.

2. AC Specification

PARAMETERS	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Input Frequency		10		27	MHz
Output Frequency	At 3.3V			160	MHz
Output Rise Time	0.8V to 2.0V with no load			1.5	ns
Output Fall Time	2.0V to 0.8V with no load			1.5	ns
Duty Cycle	At VDD/2	45	50	55	%
Max. Absolute Jitter	Short term		±100		ps
Max. Jitter, cycle to cycle				60	ps
Phase Noise, relative to carrier, 125Mhz(x5)	100 Hz offset, 3.3V		*		dBc/Hz
Phase Noise, relative to carrier, 125Mhz(x5)	1kHz offset, 3.3V		*		dBc/Hz
Phase Noise, relative to carrier, 125Mhz(x5)	10kHz offset, 3.3V		*		dBc/Hz
Phase Noise, relative to carrier, 125Mhz(x5)	100kHz offset, 3.3V		*		dBc/Hz

Note: *: To be measured.

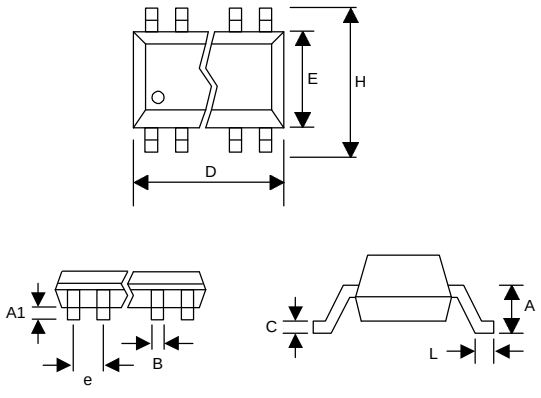
3. DC Specification

PARAMETERS	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Operating Voltage	VDD		3.135		3.465	V
Input High Voltage	V_{IH}		2			V
Input Low Voltage	V_{IL}				0.8	V
Input High Voltage	V_{IH}	For XIN pin	(VDD/2) + 1	VDD/2		V
Input Low Voltage	V_{IL}	For XIN pin		VDD/2	(VDD/2) – 1	V
Output High Voltage	V_{OH}	I_{OH} = -25mA	2.4			V
Output Low Voltage	V_{OL}	I_{OL} = 25mA			0.4	V
Output High Voltage At CMOS Level	V_{OH}	I_{OH} = -8mA	VDD-0.4			V
Operating Supply Current	I_{DD}	No Load		35		mA
Short-circuit Current	I_S			±120		mA
Input Capacitance	C_{IN}	OE, Select Pins		5		pF

PACKAGE INFORMATION

16 PIN Narrow SOIC, TSSOP (mm)

	SOIC		TSSOP	
Symbol	Min.	Max.	Min.	Max.
A	1.35	1.75	-	1.20
A1	0.10	0.25	0.05	0.15
B	0.33	0.51	0.19	0.30
C	0.19	0.25	0.09	0.20
D	9.80	10.00	4.90	5.10
E	3.80	4.00	4.30	4.50
H	5.80	6.20	6.40 BSC	
L	0.40	1.27	0.45	0.75
e	1.27 BSC		0.65 BSC	



ORDERING INFORMATION

For part ordering, please contact our Sales Department:
47745 Fremont Blvd., Fremont, CA 94538, USA
Tel: (510) 492-0990 Fax: (510) 492-0991

PART NUMBER
The order number for this device is a combination of the following:
Device number, Package type and Operating temperature range

PLL601-01 S C

PART NUMBER

TEMPERATURATURE
C=COMMERCIAL
M=MILITARY
I=INDUSTRAL

PACKAGE TYPE
S=SOIC, O=TSSOP